



NOT MAN, BUT MAN-LIKE.

A REPLY

TO

"NOT LIKE MAN" OF THE PROFESSOR OF ANATOMY IN
THE UNIVERSITY OF MELBOURNE,

BY

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"If the writer who attacks another's notions does not deal fairly with his adversary, the diligent reader has it always in his power, by resorting to the work examined, to do justice to the author and to himself."—BURKE.

"Facts, falsely stated or maliciously coloured, require, too frequently, elaborate details for their exposure."—DE QUINCEY.

NOT MAN, BUT MAN-LIKE.

The lecture lately given by the professor of anatomy may be taken as a fair illustration of the theory it was meant to refute. It is now printed, and in this form differs as widely from the second version as that differed from the first, showing what may be done with the principle of progressive development imported into literature. At first a rather animated sermon about monkeys, to whom nothing was revealed, rebuking an infidel professor, and warning certain dreamers to shake off a nightmare, or be for ever lost, it next became a sober homily in natural theology ; and now, in its third *stirp*, it has grown to be a treatise so severely scientific as to contain little else than a meagre catalogue of particulars, without the idea which connects them. More properly these are the changes of *atavism*, for in many things there is a falling off. There is no longer the glowing rhetoric, the poetic verve, the apt quotation, the keen interrogatory, the climactic declamation, the almost prophetic strain, but merely the dry bones and ligaments of the question, unquickened by any nerve of its philosophy. The lecture and the lecturer revert to their primitive types. There is, moreover, another astounding transmutation. The devil gives way to the Creator, but equally out of place. The former was at work prompting the writer of a mischievous book, the latter is mechanically occupied putting a short muscle to an imaginary hand, placed at a right angle to the bones of an equally hypothetical leg, which brings prime agents and second causes into very odd relation.

The particular advantage of having the lecture developed into what may be considered its permanent type, is in the possibility of examining it without risk of doing injustice to the author, or of denying to him the same fair-play sought for his opponent.

Laying aside then the teleological part of the controversy, with its theological accessories and irrelevancies, and keeping strictly to the physiological, what is it that the author essays to prove? That his opponent commits an error in saying that there is a structural affinity between the foot of man and the foot of the gorilla—that that which is asserted to be on plan and principle a foot has not, beyond a certain point, any resemblance to a foot whatever—that the differences are not merely secondary, but typical. If this comprised the whole of the original proposition, it would limit the discussion to a narrow compass. But it does not. On the contrary, that, as plainly as words could set it forth, asserted that, be the difference between the hand and foot of man and those of the gorilla what they may, the differences between those of the gorilla and those of the lower apes are much greater—the inference being, that from the last up through the higher there is a gradation to man. This, true or false, is the argument, and it is founded upon a full comparative survey of every species. To confute it, an equally extended survey has not been made, but only a single individual of the series has been examined, from the peculiarities of which the characteristics of all the others are assumed. The specimen which thus supplies a universal test is one of the most lowly organized of the simiadae, but higher than the cebidae, and higher still than the lemuridae. It is found to present wide structural differences in the foot from the foot of man, and corresponding differences are at once assumed to exist in the higher apes. *Macacus* is in short established as the prototype of the entire order, from gorilla

down to aye-aye ; whatever structure it possesses so must they, as things equal to the same things are equal to one another. However cautiously we may be disposed to accept for the present the statement so unhesitatingly made by Professor Huxley, it is surely puerile to contradict it so positively upon a mere assumption. The rough guess may be a true one, but judgment must be reserved until a gorilla and a colugo can be dissected as well as a macaque. A rigorously severe anatomical logician should not venture his reputation upon a cursory glance at a stuffed specimen any more than upon a cursory glance at its anatomy, for the one is fully as liable to be fallacious as the other. Such a dash at truth shows some intrepidity, but more as the valour of temperament than the courage of judgment. It may be marvellous if the terminal division of the hind limb of a gorilla does not differ as much from the foot of man as does the terminal division of the hind limb of the macaque ; but it may nevertheless be true for all that, the dissection of two macaques to the contrary notwithstanding : and, what is more, it may yet be shown that the foot of the macaque differs as much from the foot of those lower in the scale than itself as it differs from those above it, to the verification of Huxley's assertion ; to increase the probability of which there is the account of the pedal modifications by Professor Owen, showing that in all the characters by which the bones of the foot depart in the gorilla from the human type, those of the chimpanzee recede in a greater degree.

The erudition of the professor of anatomy would appear to be as defective as his logic is fallacious. A little inquiry into the results of the labours of his predecessors would have saved him from the egotism of a fancied originality. The grandly-sounding invention of finger-foot—the fruit of an intellectual coition between a physiologist and a philologist—a hybrid likely to be as sterile as other specific crosses,

is, after all, as old as Aristotle. The name is as much a resuscitation as the anatomy, and both are equally erroneous with the logic. “Ἐχει δὲ ἰδίους τοὺς πόδας· εἰσὶ γὰρ οἷον χεῖρες μεγάλαι. Καὶ οἱ δακτύλοι ὥσπερ οἱ τῶν χειρῶν· ὁ μέσος μακρότατος.” And afterwards adds :—“ὥσπερ ανεῖ συγκειμένους ἐκ χειρὸς καὶ ποδὸς· ἐκ μὲν ποδὸς, κατὰ τὸ τῆς πτερνῆς ἔχαιτον· ἐκ δὲ χειρὸς, τᾶλλα μέρη” :—“It has feet peculiar; for they are like large hands, and the fingers are like the fingers of the hand; the middle being the longest. Just as if they were compounded of a hand and a foot: of a foot indeed in the hindmost part of the heel; and of a hand in the other parts.” If from this description the Stagirite had been required to coin an ordinal term out of that language which seems to some moderns dead and fossilized in more senses than one, he would have said, not *cheiropod* (hand-foot), but *dactylopod* (finger-foot), unless some progressive changes have occurred in the meaning of Greek roots under the process of artificial selection according to university notions.

Coming to the special anatomy of the foot, the first departure from the human type is stated to be in the ento-cuneiform bone; but as Owen has already given a full account of this variation, there is no particular necessity for another original description. Then follows details of the *tibialis anticus* muscle, and the now familiar *extensor ossis metacarpi pollicis*, with this new phase, that it is no longer *metacarpi* but *metatarsi*; and it is to be regretted that the same sensible change was not made in the pedal technicalities throughout, if not to show contrition, at least to avoid confusion sure to arise in following the descriptions when the parts are at one time spoken of as pertaining to a foot and at another time to a hand.

There is not in the whole lecture stronger proof of the deficiency of the lecturer as a philosophical anatomist than the account given of these so-called two muscles. From a

single glance, it is plain that they are the very counterpart of the *tibialis anticus* in man. Taken together, if it must be admitted for the sake of the argument that they are separate muscles, they are essentially the equivalent of the one in man—the same in origin, relations, insertions, and in actions. This will be in a moment apparent by comparing the description here given with that in any manual of human anatomy. But to restrict the test to the insertions and actions only. In the lecture we are told that the first portion of the muscle is “inserted into the internal and plantar aspect of the internal cuneiform bone. Its action is to turn the sole of the foot inwards.” Of the second portion of the muscle it is said, “its tendon passes down close to that of the former muscle, and is inserted into the inner side of the base of the metatarsal bone of the thumb”—that is, of the macaque’s hind thumb, or great toe. “The name expresses its action.” From the lecture let us turn to any work on anatomy, say Gray’s, because of the well-defined diagrammatic illustrations, and it will be found stated that the *tibialis anticus* “is inserted into the inner side of the internal cuneiform bone, *and* base of the metatarsal bone of the great toe.” Referring to the drawing of the bones of the human foot, these two separate insertions are marked as distinctly as they can be shown in any monkey. For a similar blunder, the examiner in anatomy will reject the first junior student who goes up before him. Furthermore, the actions of the muscle in man are twofold. It turns inwards the sole of the foot, and raises the metatarsal bone of the great toe. Let any one try this upon himself, and he will find the tendon start out before the instep: or let him try to balance himself upon his heels, and he will see how the same muscle acts in maintaining the body in the erect posture. If this character of the muscle be taken in conjunction with what Dr. Humphray says of the variations

of the arch of the instep in Europeans and Negroes, and of the more near resemblance in the latter to the monkeys, an idea may be gained of the philosophy of its double insertion, inappreciable perhaps by some anatomists of the proletarian school. But it is not, even according to this dissection of the foot of the monkey, any more a double muscle than the deep flexor of the hand, the index tendon of which is for the greater part of its course distinct, yet no one ever speaks of it as a separate muscle. Thus, then, in origin, insertion, and action, the *tibialis anticus* in man is the homologue of the double muscle of the monkey, and the assertion of "Opifer" that no new muscle is superadded is substantially true. In corroboration of this, the testimony of one of the lecturer's own friends may be adduced, who says, by way of apology for Huxley's blundering dissections, that "the fleshy portion of this muscle (*extensor ossis*, &c.) is so intimately connected with that of the *tibialis anticus*, and its tendon so concealed in the natural condition of the parts, that it might readily escape observation, unless a careful dissection were made. Tyson seems to have remarked that the *tibialis anticus* was more largely developed in the ape than in man, and it appears more than probable that the two muscles in question were viewed conjointly." To this it may be answered that Tyson does not "seem to say," but says so positively, and only the most contemptible of motives could have suggested such a gloss. Even the professor of anatomy thus fawned upon spoke more respectfully of Tyson, when reading the extracts from his work in Huxley's book; and a study of his elaborate treatise and a look at his plates prove anything said in his praise as a careful [anatomist] well merited. Besides, there is nothing in the other long muscles of the leg or forearm that requires this cautious dissection, except it be among tyros, to prevent them from making more muscles than actually exist—a standing caution, by the way, in

every dissecting-room. Everyone who has dissected an anthropoid ape has made the same oversight. Martin, who gives, at p. 398 of his work, a description, with drawings, of the dissection of the orang's foot, makes no mention of it; nor Owen, nor either of the writers of the *Edinburgh* or *Anthropological Reviews*. Then why should Huxley, for the same oversight, alleged upon the dissection of a different animal, have drawn down the terrible denunciation so well remembered upon his devoted reputation? The chivalrous burst of indignant resentment against the contumacious "Opifer" may be pleaded as a set-off for the ungenerous attack, so well was it approved of as against the common enemy to the genus *batrachophagi*, indigenous in the moral morass surrounding the Melbourne University.

The next muscle named is the *extensor proprius*. By what feint of phraseology it derives its synonyme of *secundi internodii* the most willing to follow the argument will be at a loss to know. It is in every sense a great toe muscle, and nothing except a jugglery of technicalities can call it anything else; nor is there a *primi internodii* to give it a title to the comparative degree, unless it be that tendon of the *extensor brevis pollicis*, which goes to the great toe. But it is simply preposterous to speak of this as the corresponding muscle to a muscle of the forearm, and the "curious fact that the same relation exists between the *hind thumb* of monkey and the thumb of man," is curious indeed in more senses than one—curious, as the most ingenious piece of artificial anatomy extant.

Following this there is a very specious account of the action of the *peroneus longus*, one of the three muscles said by Huxley to be characteristic of a foot. Why its adaptation to the arboreal habits of its possessor should prove a fundamental change of type from a great-toe to a thumb surpasses ordinary comprehension, almost as much so as its

power "to keep the animal's body in equilibrium when swaying to and fro!"

The *extensor brevis digitorum*, the next muscle examined, is another of the three mentioned as distinguishing a foot from a hand. In describing it the whole argument is outraged to a degree which makes the affair a complete travestie of a scientific discussion. Thus the lecturer has the assurance to infer that "the existence of this muscle does not prove the terminal division of the hind limb of the monkey to be a foot; true, it is not found in the hand, where the fingers are in the same line with the bones of the forearm, but were the Creator to place a hand at an angle to the bones of the leg, whence the *extensor longus digitorum* arises, a short muscle would be equally needed, and consequently be found." If this is not a cool and deliberate method of getting over an otherwise insuperable difficulty, there is no longer dishonesty in deep or shallow sophistry. It begs the whole question with a poor "if." And thus are Huxley's distinguishing points between hand and foot summarily got rid of. The rest is easy for a gentleman who can with so much facility "originate a new era in scientific research."

A description of the *flexor longus pollicis* is next given as original, although fully described in the last number of the *Edinburgh Review*; and while no plagiarism is meant to be insinuated, yet it may be observed that the two statements of the division of the tendon as a peculiarity, and different from the corresponding part in man, are precisely alike, the reviewer's being of course the prior. Whether this peculiarity of the tendon bears out Owen's inference, that no transmutation from a lower to a higher race of beings could have taken place, may be matter for difference of opinion, but it does not come within the scope of this article to discuss it. Like the last-named muscle, the oppo-

site, or *opponens pollicis*, is described in the *Edinburgh Review*, originality being here likewise forestalled.

The *lumbricales* muscles are now for the first time noticed in the evolution of this remarkable lecture, so that the lecturer seems at last alive to the fact that the fiddler's muscles are as much concerned in the finer movements of the fingers, in drawing and painting and other delicate manipulations, as the *interossei*. They may, indeed, be well and truly said to be peculiarly the muscles of the fine arts, and yet they are common to both hand and foot. Much stress may be laid upon this point, for a certain arrangement of the *interossei* was described as completely indicative of the hand-like character of the monkey's foot. It was not because the hand had *interossei* and the foot none, but simply because one of these muscles was attached to the middle finger in the hand, and the corresponding muscle to the second toe in the foot. They were spoken of as conferring upon the fingers that nimble motion peculiar to them; but if they alone gave this distinctive character to the hand, why cannot they confer the same upon the foot? Is it the mere difference of attachment of one muscle or even of two—for that must be all—that does it? In every other respect the muscles are alike in hand and foot. The *lumbricales*, called from their supposed uses the *fidicini*, or fiddler's muscles, have the very same relations in hand and foot to the tendons which bend the last joints of the digits, and must have, so far as their anatomy enables us to judge, the same function as instruments for the expression of thought, for that, it must be presumed, is the final cause meant to be indicated by the elaborate demonstration of the *interossei*. But if that final cause be different in either extremity, the difference lies solely in the tendinous insertions of the second dorsal and the first palmar *interossei*, and not in any distinctive co-relation of the muscles themselves: which con-

stitutes as minute and æsthetical a definition of a separate order of animals as is given for a species by the spot upon a butterfly's wing. This is what is peremptorily declared to be "the arrangement of muscles in which we see the greatest departure from the corresponding series in the human foot. As the hand of both man and monkey is characterized by the presence of fingers and of special muscles to move them, so is the foot of monkey; we have now lost all trace of a foot, and have before us the bones and muscles of a hand." There need be no hesitation in pronouncing this the boldest and most stupid mis-statement of a false analogy in the whole range of an overstrained natural theology. It is tantamount to saying that all the *lumbricales* and *interossei* are absent from the foot because two of them slightly vary, and betrays a total misconception of that doctrine—so largely commented upon by natural theologists—of the special adaptation of typical forms, of which the shape and uses of a monkey's foot, as an instrument of prehension, forms so admirable an illustration. It is in some degree the analogue of the hand, but in none the homologue, except to the extent in which both hand and foot, even in man, are homotypal. "No part of the animal structure more fully illustrates the unity of design, or the skill of the Intellect which has so adapted a single organ to such multiplied ends" as the organs of locomotion, say Agassiz and Gould. It is stated in the lecture that the monkey's foot, beyond the tarsal bones, presents no resemblance whatever to the foot of man, "but, being adapted to different functions, is totally different in the proportion of its parts and in the principles of its construction." The confusion of terms appropriate for ideas is here painfully evident, inasmuch as an adaptation needs not a different principle of construction, but on the contrary, actually signifies the common principle of construction *adapted* to a different use. "Perfect, exquisitely

beautiful in its anatomy, the monkey's foot is for walking an ungainly, useless member." Ungainly it may be—somewhat in-toed—but useless for walking erect it is not, as any one who ever closely watched a chimpanzee or orang in its own habitat can well attest. Truly it is not well fashioned for a pirouette, but then when the Bosjesman "trips it on the light fantastie toe," he too has an ungainly shamble—he pirouettes upon his heel. His foot is not so "supremely fitted for clambering and climbing" as is the monkey's, yet for such work it is better adapted than the feet of those races of men who, possessing a firmly arched instep, excel rather in "subliming" an audience by standing on tiptoe, as the professor of anatomy would say.

From this mustering of minutiae, the lecturer exultingly enunciates the grand deduction — "Surely" (therefore) "the intricacies of the monkey's foot were planned, as was also the comparative simplicity of man's! They could never run the one into the other, or, to use a fashionably scientific term, be 'developed' the one from the other." Naturalists need no longer find any difficulty in explaining the supposed descent of the existing 250 species of monkeys from the single species saved from the Noachian Deluge. Darwin says, "We should be extremely cautious in concluding that an organ could not have been formed by transitional gradations of some kind;" but after this "could never," we may infer that Darwin simply knew too many of the facts of the case to be able to make up his mind.

The ascensive conclusion supposed to be reached by this dissection of a monkey's foot is that: "Of a certainty the man-like apes are finger-footed equally with *Macacus*." In the face of this it would be important to inquire whether every step of the process has been fairly gone over—whether every ape has been examined, were it not quite well known that nothing of the kind has been done. On the contrary,

as upon a doubt Huxley's assertion to the contrary was first called in question, so upon a "no doubt" it is determined that the first doubt was right. Boyle's *Scientific Sceptic* never equalled this. "From drawings in Professor Huxley's book, and from the stuffed specimens in England, I have no doubt that the gorilla, like every other ape and monkey, is cheiropodous." As this is said in the teeth of a positive assertion to the contrary, the lecturer surely cannot say he has followed the laborious Huxley in his dissections, unless it were as a waning moon following the light and losing it, until he may perchance find it again from the same source.

But Huxley is further accused of having generalized upon insufficient evidence; of going only as far as the tarsus, and finding there things meet for a foot of stopping, without looking into the deeper lying layers of "truth-telling" muscles. Yet the lecturer himself does not appear to have probed every monkey mystery with the first incisions, for the four small muscles called *contrahentes* now for the first time come to light. Was it a careless dissector who missed them in the first macaque, or did they not exist there, or were the two animals of the same species? They neither exist in the hand nor foot of man, nor in the hand of "macacus," so the foot of this creature is unique. But although Huxley does not enter into the same detail about these, he evidently has not overlooked them, if the passage at p. 93 of his book has any meaning. There the short flexor is said to differ from that of man, and the lower apes to depart from the gorilla, by an exaggeration of the same character. The gorilla, again, differs from man in the mode of interlacing of the long flexor tendons; and the lower apes differ from the gorilla in exhibiting yet other, sometimes very complex, arrangements of the same parts. These minor modifications are mentioned in a general summary, because not materially affecting the main argument. The

one writer generalises where the other goes minutely into irrelevant particulars, each according to the workings of his intellectual capacity.

It is scarcely necessary to follow out this myology much further. No allusion is made to actions of pronation and supination, and yet they are more distinctive of a hand from a foot than any other character. A first and a third layer of muscles in the sole of the foot are described as if they in some essential thing differed from the corresponding layers in the human foot. The short flexor of Huxley dwindles in *macacus* to the *flexor brevis indicis*; that is to say, the muscle is in a partially rudimentary state. Whether it too is in a condition of *atavism* is not however so clear as in the other case. The *adductor pollicis* is said to be more like the corresponding muscle of the hand than of the foot of man, although it does not appear so from the description, which agrees in man and monkey. In the lecture it is said to arise from the second and third metatarsal bones, and to be inserted along with the *flexor brevis*. In the treatise of anatomy, it is described as arising in man from the second, third, and fourth metatarsal bones, to be inserted along with the *flexor brevis*. Upon comparing these relations with the foot of both man and monkey with the muscle in the thumb of a man's hand, we find that in the last it is described as of a triangular form, arising by its broad base from the *whole length of the metacarpal bone of the middle finger* to be inserted along with the *flexor brevis* of the thumb. Whether then is the adductor of the monkey's great toe liker the adductor of man's great toe than to that of his thumb? Would a comparative anatomist stop to ask?

The absence of the *peroneus tertius* was on the two former occasions mentioned as an important circumstance, forgetful that it is sometimes wanting in the human foot. In another of his lectures, Professor Huxley observes

that "every anatomist will tell you that there is nothing commoner, in dissecting the human body, than to meet with what are called muscular variations—that is, if you dissect two bodies very carefully, you will probably find that the modes of attachment and insertion of the muscles are not exactly the same in both, there being great peculiarities in the mode in which the muscles are arranged ; and it is very singular, that you will come upon arrangements of the muscles very similar indeed to the same parts in the Apes," and the muscle in question furnishes an example in point.

The absence of the *transversus pedis* from the monkey's foot is said to make the affinity of this to a hand complete ; but there is nothing more wonderful in this muscle becoming rudimentary, or even disappearing, any more than the three outer tendons of the short flexor just alluded to. At any rate, the observation is not new, although vainly paraded as such ; for Tyson, in the plainest terms, has said the same, and does not merely "seem" to do so, as the unwilling hearers of truth would say. What is more, he has anticipated all that is important in this farrago of new discovery of the thumb-like great toe of the monkey, remarking, "The muscles of the great toe differed from the human." "The Parisians tell us the great toes of the monkeys had muscles like those of a man's thumb." And adds, "The *transversus pedis* did not appear in this animal." "This great toe, being set off from the range of the others, more resembled a thumb." "The heel, the *tarsus*, and *metatarsus* were like the human, but all the toes were liker to the ape and monkey kind ; for the toes here—if we may call them toes, and not rather fingers—were almost as long as the fingers in the hand." And yet he affirms that the pygmie more resembled a man than apes and monkeys do, "in being in all respects designed by *Nature* to walk erect." But Tyson also says that "the muscles of no part disagreed so much from those

of men as those of the thigh of this animal. Here was no *gluteus minor*, and the *gluteus maximus* was merely tendinous at its origin:" but he does not speculate upon the possibility of its development into the full form of the Hottentot.

Having scrutinized this production we find, among the many absurdities and things neither new nor true, after all some claim to originality. The statement of the arrangement of the *interossei* ranks as a contribution to anatomical science with the discovery of the microscopical foramen, and the university as well as the medical society has for once been original.

Tyson, who did not wish to lower men to the level of brutes directly, nor indirectly by exalting monkeys, has yet some curious remarks upon their consanguinity very pertinent to the present discussion, and worth noticing before concluding it. To render his disquisition useful, he, like Huxley, but unlike Huxley's critics, made a comparative survey of the pygmie with a monkey, an ape, and a man, that, "by viewing the same parts together, we may observe nature's gradation in the formation of animal bodies, and the transitions made from one to another, than which nothing can more conduce to the attainment of true knowledge of the structure and uses of the parts." In doing this, he had no irreverent motive; for after quoting a remark of Scaliger's on the chain of relation from the highest to the lowest, he devoutly remarks:—"This gradation can't but be taken notice of by any that are curious in observing the wonders of the creation; and the more he observes it, the more venerable ideas 'twill give him of the Great Creator: and it would be the perfection of natural history could it be attained, to enumerate and remark all the different species, and their gradual perfections from one to another."

After tracing an exact general resemblance between the brain of the pygmie and man's, this thoughtful anatomist says there is no reason to think that because these organs are alike they perform the same functions, "for then our pygmie might be really a man." On the contrary, he declares that "those nobler faculties in the mind of man must certainly have a higher principle; and matter organized could never produce them; for why else, where the organ is the same, should not the actions be the same too?" This is quoted here in order to bring it into juxtaposition with a passage of precisely similar import at p. 567 of the article in the last number of the *Edinburgh Review*:—"We believe that all the higher faculties of human nature—all the powers that make us man—are visibly independent of mere structural organization." "To these questions structural organization gives no answer at all." By comparing these two passages, it may be seen how little change of opinion, or in the mode of expressing it, there has been during all the years that have passed since the first was written.

But if the last writer be compared with himself, he is by no means consistent. "So little is known of the true functions of the different parts and organs of the brain, that we believe no one has even attempted to assign any especial purpose in the animal economy, or in the operations of the brain, to the hippocampus." How, it may be asked, can it be asserted that all the higher faculties of the mind are independent of structural organization, when there is so much of that organization to which we can assign no function? The truth is, indeed, that this organization has not been sufficiently investigated to enable us to distribute its functions. The co-relation of mind and brain is not yet so well known as to warrant us thus to dogmatise. It still remains amongst the unsolved problems of biology, and no

man can say how far thought is or is not the result of organization, and in respect to it we may truly say, in the words of Agassiz, that "to decide upon the end when advancing science is only opening the way, is to raise the apotheosis of error."

If articulate speech, or language in any definition, be peculiar to man, that portion of the encephalon supposed to co-ordinate the workings of the faculty of speech should be correspondingly developed; and it would give more definite results to investigate these parts, say the olivary bodies, than any mere comparison of a hippocampus or other fanciful and arbitrary division or section of the brain. Perhaps Mr. Dunn's new theory of the special functions of the transverse convolutions may suggest some more exact method of comparing cerebral structure with psychical characters, than any we have yet had.

Whether the brain originates thought, or is only the instrument of thought, are questions undecided, further than that it furnishes the conditions necessary for the manifestations of mind. How or why it does so, must be regarded as ultimate facts in science. Metaphysically, mind may be studied as a thing apart from organization; but physiologically brain cannot so be regarded as an entity apart from mind. The reviewer sees mind without brain, and brain without mind, but he perceives not the nexus that joins them. But can he say that physiologists have sought for it? "There can be no doubt," says Professor Bennett, "that the relation between the molecular, nuclear, and cell elements of the hemispherical ganglion, as the instrument of mind, must be most important," and yet "he is not acquainted with any one who, having qualified himself for the task by a careful study of histology, has investigated them." "What we desiderate is a careful scrutiny of the organ." "The molecules in the hemispherical ganglion, so

essentially connected with the functions of the brain, are visible molecules." How, then, can metaphysical speculations alone determine the functions of structure, human or comparative, in an inquiry scarcely yet entered upon? To work it out, the comparative study of mind and brain becomes of the highest consequence, if in the least degree it can aid it. If it can aid it by proving the negation of moral and mental characteristics from the absence of structure, or, still negatively, by affording no illustration of the mental and moral difference of races which, as between the European and the African, are even greater than the physical. But this study, as an aid to anthropology, or for itself alone, cannot surely be promoted by raising the finger in obloquy at every one who attempts it, or to taboo it as a task only fitted for the irreligious. Consistently enough, truly, may this be done by a university, which, in craven deference to the blind dominance of sectaries, interdicts the reading of a moral philosophy within its halls. Under such tutelaries, is it to be wondered at that there is no physiologist of the advancing school who dare announce himself in high places? "Not being able to raise the brutes to man, they degrade man to the level of the brutes," exclaims the reviewer. "The ancients were fond of making brutes to be men: on the contrary now, most unphilosophically, the humour is to make men but mere brutes and matter;" so likewise exclaimed Tyson, adding, however, "whereas, in truth, man is part a brute, part an angel, and is that link in the creation that joins them both together."

How far the necessity for propitiating persons and prejudices is answerable for these opinions is very apparent; and, just as the older anatomist has throughout had priority, so had he the greatest plausibility in these matters. Moderns must conciliate public opinion—he had only his patron. They bend the neck of science to the yoke of

Demos, as he did to gentler graith, with a controlling power beyond and above both. Inscribing his book to the Lord Chancellor, Tyson archly observes of his pygmie that, "The animal of which I have given the anatomy coming nearest to mankind, seems the nexus of the animal and rational, as your lordship and those of your high rank and order for knowledge and wisdom, approaching nearest to that kind of being which is next above us, connect the visible and unvisible world." In this paragon of flattering dedications, the author adroitly conciliates a hearing for his theory by an illustration of it. Vain man is willing to be flattered by his improbability; but nothing must, "with Roman severity, admonish the conqueror that he is but dust." The evidences of a progressive enlightenment are not apparent in this direction: for, as in the *Religio Medici*, all are denounced as infidels and atheists who deny the reality of witches, so are those denounced who dare question the dogma of specific creations. In this branding process the *Edinburgh Review* and its Melbourne namesake, as the zenith and nadir of the literary world, hold up conspicuous lights. Their aurora, boreal and austral, are as things intermediate between telluric coruscations and the sun, and must be typical of an ascending scale, even among the illuminati. The president of the Anthropological Society of London, lately alluded to a prevalent belief upon the Continent that cultivators of science in England are "priest-ridden, and afraid to give utterance to their scientific opinions through fear of public scandal." Had he been resident among us, he would not have defended all his countrymen against this as a gross calumny. That "the question of the origin of man, which owing to assumed vested interests, ignorance and superstition, had long been a forbidden subject of controversy, has now forced itself not only on the attention of men of science, but on that of the public generally," may truly enough be

said of the public at home ; but here the dread of incurring the displeasure of hierarchs and sacerdotes, or that inbecility which is tortured by the bugbear of singularity, still deters too many from more than furtive studies of these mysteries of Nature. However, no one can now be ridiculed as the advocate of doctrines discredited by every scientific man in Europe. True or false, they are at least not obsolete. Fashion, failing intelligence, will make them familiar, perhaps even in Melbourne, and the prediction made in *The Argus*, on the 3rd of August, 1858, that doctrines now confined to the studious and candid few, will eventually become the creed of the learned, and finally among the elementary principles of education, will be verified. "The day is long gone by when the probability of transmutation could be sneered down as the phantasm of a dreamer, or the product of the scepticism of an infidel. The possibility, nay, even the extreme likelihood of such a law being eventually established is now rapidly becoming a tolerated doctrine in the creed of deep-thinking, scientific men," is the statement of one of Huxley's severest critics—of one who was a progressionist when Huxley supported views the reverse of what he now advocates. This recognition of truth will be a fresh proof of the supremacy of human reason, and one of its highest triumphs. Then will man better look "from Nature up to Nature's God"—better than by gazing through the distorting media of invented creeds and cunning formularies. The faggot ever was an uncertain beacon of the truth, but it shows up a new light. A worthy minister facetiously suggests that man is the only animal that uses a gridiron, which may be called a homely way of bringing an infidel opinion to the stake.

But it is not alone in the foot that anatomical proofs are found of the animal's being destined, to a certain extent, for the erect posture. The articulation of the hip joint, the

development of the mastoid processes, the closure of the peritoneal cavity at the groins, the adhesion of the pericardium to the diaphragm, &c. &c., might be further adduced as additional evidences. So also the bend of the elbow, the squareness of the thorax, the position of the scapulæ, all show that the gression of the animal is not naturally upon all fours. The usual attitude is crouching, or more or less diagonal, a posture intermediate between the upright and horizontal. The above-named anatomical arrangements, though indicative of the erect posture, yet do not prove that to be necessarily terrestrial; for they would be equally related to the same posture when the animal is among the branches of trees. The animal is most truly called semi-terrestrial. The thighs are drawn up to the body when sitting; an attitude assumed so commonly by the native traders of India that visitors to their bazaars are at once impressed with the belief of its being the most easy and natural to them. With the femur relatively longer than the tibia, the ischia come nearer to a level with the heels than in Europeans; the flatness of the instep facilitating the position.

So likewise might the whole arrangement of the reproductive organs be adduced as affording further evidence of the closer resemblance in physical structure of the higher apes to man. Anatomically and physiologically those organs are precisely like those of the human being, and in nothing more so than in the ventral mode of coitus, a circumstance which is not set forth so prominently as might have been expected in these researches for a test of distinction between the two races. It would greatly strengthen the affirmative side of the argument to ascertain at which species the habit changes. The lower apes differ in this particular; and monkeys are like dogs, although the os penis is not always if ever present. Many of the natural habits of the animals agree-

ing with this physical conformation could also be referred to ; and, excluding as romances or travellers' tales, all narratives of females having had children by apes, and the legendary belief among some negro tribes that the higher apes are mixed generations, there are yet other traits of character not so to be set aside. Of this kind it would appear almost over-credulous to allude to the female orang described as bashful, and when gazed at hiding her face in the bosom of the male ; yet the instance is given by Martin as well authenticated. But the mode of tending the young, the adoption of artificial weapons, the manner of putting the dead out of sight, &c. &c., must accord to them the rank in the scale of creation, not co-ordinate with, but subordinate to man. Whether there has been any developmental transition from the one to the other is quite another question, to be affirmed or denied by analogy alone ; for of demonstrative proofs, that kind of evidence essential to the meaner orders of non-reflecting human intellect, they are quite beyond man's reach.

Of the numerous attempts to point out the grand distinctive character of man not one has succeeded. The erect posture, articulate speech, written language, self-consciousness, the idea of a superior divinity, the preparation of food, all fail of being either specific or universally applicable ; and it is now admitted that there is really no such thing. Even Owen confesses that the determination of the difference between *Homo* and *Pithecus* is the anatomist's difficulty. " We are now at the very threshold of the great controversy respecting man's true zoological position," and every effort is made to deter those who would enter upon the investigation of the subject by "coercing reason, raising the cry of ' treason to humanity,' and by exciting the feelings of the crowd, which can neither understand nor sympathize with such subtle speculations."

Space will not permit of further exposure of the host of fallacies constantly uttered upon this subject, and one more only will be alluded to. In endeavouring to refute the assertion of ethnologists, that the lower types of mankind and the highest apes are found indigenous within the same geographical areas, one fact is adduced as an argument, that in Australia, where a very "besotted" type of mankind is aboriginal, there are none of the ape kind whatever. But the cause of this apparent exception to an otherwise invariable rule has not been investigated, otherwise it would have been shown that it is not clear that Australia has been a genetic centre of any portion of the human race, even according to the theory of the polygenists; while another obvious fact is overlooked, that there are no apes, because there is no suitable food indigenous in the country. "There is a striking relation between the fauna and flora, the limit of the former being oftentimes determined, so far as terrestrial animals are concerned, by the extent of the latter," according to Agassiz and Gould. And, more precisely, the Professor of Geology at Oxford remarks, that "An example of the limitation of a race to terrestrial conditions is afforded by the gorilla; that monstrous anthropoid animal of the eastern coast of Africa, whose residence seems limited by the forests which supply him with food." What effect a flora like that of Borneo, in the tropical parts of Australia, would have had upon the fauna, is, of course, purely a subject of speculation, although analogy would lead to a very definite opinion. Such is a fair specimen of the mode of reasoning adopted by influential non-progressionists, upon whose stems lesser minds are content to be engrafted.

The continual liability of writers like Huxley to have their words garbled and their true opinions misrepresented, no matter how prominently and plainly they may state them, is not the least wonderful psychological development

of an age boasting of its progress in universal education in science, philosophy, refinement, and religion. It surely indicates either low moral culture in the midst of highly intellectual conditions, or, in spite of all our boasting, an imperfect mental development. If not, it must be vulgar pandering of prudence to high social influences, ready at any time to sacrifice a speculative opinion for a worldly advantage. Huxley is misreported in the face of his repeated explicit declarations to the contrary, in the assertion of his unqualified acceptance to Darwin's views, just as the hypothesis of the *Vestiges* has been over and over declared to be identical with that of Lamarck, although the author is at very great pains to indicate the radical difference between them. The former does so when he speaks of the "one link in the chain of evidence which is wanting;" and where the *Vestiges* are vindicated is familiar to every reader of the book. And if we require to see the same vicious spirit in perfection, we may turn with the reader to the *Edinburgh Review*, where the studied misrepresentation of Professor Huxley's opinions about the operation of secondary causes as opposed to specific creations is worthy of the rest of the defence. He is made indeed to argue for a final cause while falsely accused of ignoring a First. In a somewhat similar spirit did a well-known polemic, a leader in the religious world in the newspaper way, when professing to quote Baden Powell's opinion of the "*Vestiges*" from the "*Oxford Essays*" for 1857, so garble the passage as to extract only so much as was said in disparagement, placing asterisks wherever a word was said in praise. This curiosity of literature can be seen by referring to a letter signed "David Blair" in the *Argus* of March 9, 1859. It is to be presumed that this line of argument is justified on the pious fraud or white lie principle, or by what tricksters in trade would call a colourable imitation of a quotation; a trick which seems indeed to

be the canon of criticism whenever religion is defended against the so-fancied inroads of science.

But some advocates of the same views are more favoured than others in obtaining a hearing. They have a greater facility in making the necessary concessions to prejudice. Mr. Page can speak of man as a sub-creative power and new modifying agent, without endangering his orthodoxy. "Whatever may be the operating causes in the scheme of vital evolution" the governing mind has "co-adapted and co-adjusted all the forces and progressive conditions, whether displayed in a succession of creative acts, or in a series of secondary causations." Such expressions coming from Huxley, or Darwin, or from "The Vestiges," or any other progressionist, would be denounced as heretical; while they are accepted from Page as verifications of another Record. The same "flunkeyism" prevented Englishmen from having a faithful translation of the great "Cosmos," and constrained the venerable Owen to suppress an opinion when addressing the members of a university.

Under these circumstances, every one who is contented to form secondhand opinions upon such books, and such topics, from critics and reviewers, should *especially* remember the words placed at the beginning of this paper. As for Professor Huxley, and the late attack upon him, he may well borrow an answer from the same source and reply, "If I choose puny adversaries—writers of no estimation or authority—then you will justly blame me. I shall take no notice of any author who is not in estimation with those whose opinions he supports." Nor would any one in his name descend to every hostile opinion; but when a lecturer comes forward who, although individually unknown, is backed by all the adventitious authority which the pomp and circumstance of a university can give, he cannot be dismissed with the forbearance observed towards amateur

expounders. A philologer expatiating in broken grammar is not a fitter subject for ridicule than is an anatomist when mistaking his physiology; but both are fitter still for censure when their discourse becomes the vehicle of invective. Such a reason alone justifies reply upon this occasion.

TO THE EDITOR OF THE ARGUS.

Sir,—What Bacon said of medical science may truly be said of the comparative anatomy of monkeys—it is more laboured than advanced. It is growing more and more every day the “question of questions,” but getting none the nearer to a solution. It seems, however, like all other kindred topics, to have the one typical quality—of setting disputants by the ears. What they lack in physiology, they make up in ethics. These things were all pretty well exemplified in the lecture by the professor of anatomy to-day at the University. He not only showed Professor Huxley to have been wrong, and to have promulgated false doctrines to a popular audience, but even to have published them with a guilty suppression of facts in a “book which might well have been written by a devil.” If this be not strictly scientific language, it will do very well for anathema, and therefore very suitable for a university.

The English professor, it seems, has tried, in the book alluded to, to prove monkeys not, as according to old notions, four-handed, but truly two-handed and two-footed ; the modification of the foot giving rise to the old name being merely a secondary affair, and not a fundamental difference of structure. The Melbourne professor, on the other hand, essays to demonstrate by actual dissection that the difference *is* fundamental. Has he succeeded ? I decidedly think not. Full one half of the terminal part of the leg, or lower extremity, or hind limb, or whatever we may conventionally or scientifically agree to name it, is admitted to correspond in man and apes ; but the digits differ—they are not toes but fingers. The alleged proofs were certain alterations in length, mobility, latitude of motion, &c., but chiefly in muscular arrangements. To the smaller differences I shall not now allude, but as Professor Huxley was deliberately accused of wilfully avoiding mention of the muscle called *extensor ossis metacarpi pollicis*, as existing in the hind limb of the monkey, although peculiar to the thumb in man, I would suggest that the *tibialis anticus*, a muscle peculiar to the foot, was to-day mistaken for it. At least, if the ape has the latter, as it ought to have, and the

former superadded, it has two similar muscles for the self-same function, which is a work of supererogation Nature seldom indulges in. Tyson says, at p. 91, that "The *tibialis anticus* was much larger, and continued fleshy much lower down than in man." This careful anatomist does not mention *extensor ossis* as existing in the foot, and in that agrees with Huxley. But another charge of paltering with anatomical truth is added, in the alleged omission of any notice of the *transversalis pedis*, as being absent in the hind foot-hand of the ape. If Huxley really did designedly pass it by, he was very wicked, or he treated it with much levity, as was hinted; but the same thing cannot be said of Tyson, who states that "the *transversalis pedis* did not appear in this animal," viz., the pygmie, or ehimpanzee. The *extensor digitorum brevis* he likewise found absent, although the professor, in his lecture, has not said whether he found it so also.

The inference which it is meant should be drawn from the lecture is, that there is no true relationship between men and apes in these parts of their systems, and that Professor Huxley has been guilty of gross imposture in trying to make it seem otherwise, with a wicked purpose, as the long quotations from his book were read to show. But these quotations were so far garbled that they did not give to the audience all that the book contains upon this point of motive. For instance, one from page 109 was given so as to present the writer in a ludicrous light, while that at page 104 was glossed over. It runs thus:—"But in enunciating this important truth, I must guard myself against a form of misunderstanding, which is very prevalent. I find, in fact, that those who endeavour to teach what Nature so clearly shows us in this matter, are liable to have their opinions misrepresented and their phraseology garbled until they seem to say that the structural differences between man and even the highest apes are small and insignificant. Let me take this opportunity, then, of distinctly asserting, on the contrary, that they are great and significant; that every bone of a gorilla bears marks by which it might be distinguished from the corresponding bone of a man; and that in the present creation at any rate, no intermediate link bridges over the gap between *homo* and *troglydites*." The reading of this passage might have spared the writer's reputation with a certain circle; but it might also have deprived the hearers of a "sensation," and the lecturer of a little *éclat*.

The fact is overlooked, that if apes be really quadrumanous, the grand doctrine of unity of type in structure and function meets with an exception. Or if they be only hand-footed (cheiropods), a closer link with man is found than was expected ; for between bipeds and quadrupeds they would partake partly of both, and be two handed animals, with half a foot and half a hand into the bargain. Again, if, as Sir Charles Bell observes, the perfection of the hand in structure and endowments gives man his superiority—if it be in virtue of these corresponding to superior mental parts, it would follow that an animal possessing half a hand more would be more largely gifted.

However, these are logical inferences not apt to occur to a mind preoccupied by other thoughts, although we might suggest to such a mind to reflect upon them. It may do very well for a bishop, or a pious divine, to amuse a mixed audience of simiaoid *savans* at the Royal Society with stories about cats not growing up into tigers, and such like puerilities ; and if the professor of anatomy is to become the champion amongst us of orthodox physiology, he should, in like manner, choose both his place and his audience. Shakespeare contrasted with an ape is rather more striking than would be a blackfellow with his spear between his toes, like thumb and finger, but not quite so much to the purpose ; and the cut-up body of a monkey, with a dead-dress and a child's cowl on, would have more of a popular than a purely scientific interest. Then might the discussion of a "serious" topic be fitly set about with becoming levity.

July 16.

OPIFER.

